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(54) Title of Invention: RENEWAL METHOD OF EXISTING COATS

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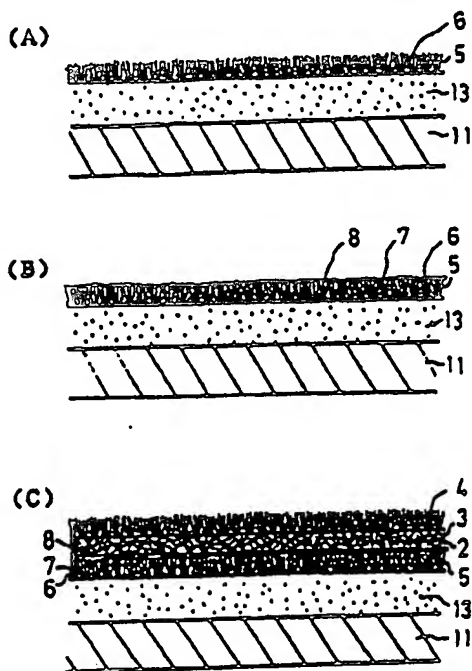
## Detailed Description

(54) Title of Invention: RENEWAL METHOD OF EXISTING COATS

(57) [Abstract]

[Problem to be solved]

To provide a rational and economic renewal construction method for regenerating impermeable all-weather existing coats or existing permeable coats in which permeability has been degraded by public use, as an artificial turf coat, ensuring permeability.



[Solution]

On an existing coat 1 or ground, a permeable buffer material 2 is laid on the surface to form a new permeable layer 3 in which the existing coat 1 is left as it is, and an artificial turf 4 is laid on the surface of the permeable layer 3. In the case of the existing coat 1 with a previously laid artificial turf 5, a permeable sheet 8 is laid on the surface after sand 7 is added to artificial turf 5 of the existing coat 1 then processed to make it flat, and the permeable layer 3 is formed on the surface by the permeable buffer material 2, to lay the artificial turf 4.

[Patent Claims]

[Claim 1]

Renewal construction method of existing coats, characterized by the fact that, on an existing coat or ground, a permeable buffer material is laid on the surface to form a new permeable layer in which the existing coat is left as it is, and an artificial turf is laid on the surface of the permeable layer.

[Claim 2]

Renewal construction method of existing coats, characterized by the fact that, on an existing impermeable coat or ground, which has not been subjected to permeability treatment, a permeable buffer material is laid on the surface, to form a new permeable layer, while the existing impermeable coat is left as it is, and an artificial turf is laid on the surface of the permeable layer.

[Claim 3]

Renewal construction method of existing coats, characterized by the fact that, on an existing permeable coat or ground, which has been subjected to permeability treatment, a permeable buffer material is laid on the surface, to form a new permeable layer, while the existing permeable coat is left as it is, and an artificial turf is laid on the surface of the permeable layer.

[Claim 4]

Renewal construction method of existing coats described in any of Claims 1-3, characterized by the fact that the surface of an existing coat is processed to make it flat, then a permeable buffer material is laid on the surface, to form a new permeable layer.

[Claim 5]

Renewal construction method of existing coats described in any of Claims 1-4, characterized by the fact that, on an existing coat with an artificial turf, ground sand is supplemented to the existing coat of the artificial turf, which is then processed to make it flat, then a permeable sheet is laid on the surface and a permeable buffer material is laid on the permeable sheet to form a new permeable layer, followed by laying an artificial turf on the surface of the permeable layer.

[Claim 6]

Renewal construction method of existing coats described in any of Claims 1-5, characterized by the fact that, on the roof of a reinforced concrete building or a steel-framed-reinforced-concrete-structure, a permeable buffer material is laid to form a new permeable layer, and then an artificial turf is laid on the surface of the permeable layer.

[Claim 7]

Renewal construction method of existing coats described in any of Claims 1-6, characterized by the fact that the permeable buffer material is made of a synthetic permeable resin formed by coating the surface of a fine, light material made of vinylidene chloride/vinyl chloride copolymer, which has predetermined thickness, with a urethane-type resin liquid, and the coated string-like material is subjected to compression processing so that it may not be divided into predetermined thickness [sic] and has areas with many openings.

[Claim 8]

Renewal construction method of existing coats described under any of Claims 1-6, characterized by the fact that the permeable buffer material is made of a plant fiber material, such as coconut fiber, etc., which is subjected to processing by compression to a predetermined thickness, with permeability due to areas with many openings, or is made of permeable wire by compression-processing a corrosion-resistant wire into a predetermined thickness and with areas with many openings.

[Claim 9]

Renewal construction method of existing coats described in Claim 7 or 8, characterized by the fact that, in the areas with openings of the permeable buffer material, sand, small ballast, rubber powder, plastic powder or glass powder, a single material or a combination of multiple materials, is sprayed in a specified quantity.

[Claim 10]

Renewal construction method of existing coats described in any of Claims 7-9, characterized by the fact that the permeable buffer material is formed in a specified size and shape in advance.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention]

This invention relates to the renewal construction method of existing coats. More specifically, this invention relates to the renewal construction method for regenerating impermeable all-weather existing coats or existing permeable coats in which permeability has been degraded by public use, as an artificial turf coat securing permeability.

[0002]

[Description of the Prior Art]

All-weather coats with an artificial turf are invaded by sand, ballast, etc. through rainstorms or various sports by public use, resulting in deteriorated water permeability. Moreover, artificial turfs are damaged after public use, regardless of indoor or outdoor use.

[0003]

For repairing coats with damages or deteriorated water permeability, the old artificial turf is peeled off and the underneath asphalt concrete, etc. are removed. Then, a new layer of permeable asphalt concrete is laid to form an artificial turf. Thus, the coat with a permeable artificial turf is formed by basically repeating the original processing procedures.

[0004]

[Problem(s) to be Solved by the Invention]

Traditionally, as described above, first the artificial turf of an existing outdoor or indoor coat must be peeled off and the underneath asphalt concrete must be removed. These procedures are very troublesome. Moreover, the old artificial turf and asphalt concrete, etc., which became unwanted, have to be disposed of as industrial wastes, causing environmental problems.

[0005]

Furthermore, the new coat construction by forming a new permeable asphalt concrete and laying an artificial turf by processing procedures basically similar to the original process has issues such as long-term construction, high construction cost, etc.

[0006]

On the other hand, there has not been a method of simple replacement of outdoor parking lots or building roofs, whose permeability is not secured, with a permeable all-weather coat.

[0007]

Therefore, the objective of the invention is to provide the rational, economic and environmentally friendly renewal construction method for regenerating impermeable all-weather existing coats or existing permeable coats in which permeability has been worsened by public use as an artificial turf coat securing permeability by forming a simple permeable layer by laying a permeable buffer material and an artificial turf directly on the original coat.

[0008]

[Means for Solving the Problem]

As the means of solving the aforementioned problem, the renewal construction method of existing coats described under Claim 1 is characterized by the fact that on an existing coat 1 or ground, a permeable buffer material 2 is laid on the surface to form a new permeable layer 3 in which the existing coat 1 is left as it is, and an artificial turf 4 is laid on the surface of the permeable layer 3.

[0009]

The renewal construction method of existing coats 1 described under Claim 2 is characterized by the fact that on an impermeable existing coat 1, which has not been subjected to permeability treatment, or ground, a permeable buffer material 2 is laid on the surface to form a new permeable layer 3 in which the impermeable existing coat 1 is left as it is, and an artificial turf 4 is laid on the surface of the permeable layer 3.

[0010]

The renewal construction method of existing coats described under Claim 3 is characterized by the fact that on a permeable existing coat 1, which has been subjected to permeability treatment, or ground, a permeable buffer material 2 is laid on the surface to form a new permeable layer 3 in the state that the permeable existing coat 1 is left as it is, and an artificial turf 4 is laid on the surface of the permeable layer 3.

[0011]

The renewal construction method of existing coats 1 described in Claim 4 is characterized by the fact that the surface of the aforementioned existing coat is processed to make it flat, and then a permeable buffer material 2 is laid on the surface to form a new permeable layer 3.

[0012]

The renewal construction method of existing coats described in Claim 5 is characterized by the fact that on the aforementioned existing coat with an artificial turf 5 laid, or ground, sand 7 is introduced into the artificial turf 5 of the existing coat 1 and processed to make it flat, then a permeable sheet 8 is laid on the surface and a permeable buffer material 2 is laid on the permeable sheet 8 to form a new permeable layer 3, followed by laying an artificial turf 4 on the surface of the permeable layer 3.

[0013]

The renewal construction method of existing coats described in Claim 6 is characterized by the fact that on the roof 10 of a reinforced concrete building or a steel-framed-reinforced-concrete-structure 9 a permeable buffer material 2 is laid on the roof 10 to form a new permeable layer 3, and then an artificial turf 4 is laid on the surface of the permeable layer 3.

[0014]

The renewal construction method of existing coats described in Claim 7 is characterized by the fact that the permeable buffer material 2 is made of a synthetic permeable resin 2A formed by coating, with an urethane-type resin liquid, the surface of a vinylidene chloride and vinyl chloride copolymer-made fine light material 20 which has predetermined thickness, and the coated string-like material 20 is subjected to compression processing so that it may not be divided into predetermined thickness and has areas with many openings 21.

[0015]

The renewal construction method of existing coats described in Claim 8 is characterized by the fact that the permeable buffer material 2 is made of a permeable buffer material 2B of plant fiber material 22, such as that of coconut seed, etc., which is subjected to compression processing into a predetermined thickness and with permeability and areas with many openings 23, or is made of permeable wire 2C by compression-processing a corrosion-resistant wire 24 into a predetermined thickness and with areas with many openings 25.

[0016]

The renewal construction method of existing coats described in Claim 9 is characterized by the fact that in the opening sections 21, 23 or 25 of the permeable buffer material 2 (2A, 2B or 2C), sand, small ballast, rubber powder, plastic powder or glass powder, a single material or a combination of multiple materials, are sprayed in a specified quantity.

[0017]

The renewal construction method of existing coats described in Claim 10 is characterized by the fact that the permeable buffer material 2 (2A, 2B or 2C) is formed in specified size and shape in advance.

[0018]

[Embodiment of the Invention and Example]

The present renewal construction method of existing coats can be used for replacing all-weather hard coats that have not been subjected to permeability treatment, or parking lots or providing building roofs having asphalt concrete floor with a permeable artificial turf coat. Moreover, existing outdoor coats, which have been subjected to permeability treatment but the permeability has been worsened by public use, can be regenerated as an artificial turf coat, securing permeability. Furthermore, the method can be used for indoor coats that have been damaged by public use.

[0019]

The embodiment of the renewal construction method of existing coats described under Claim 1 is explained as follows.

[0020]

This embodiment is suitable for processing an existing all-weather coat 1 or ground, or a parking lot with asphalt concrete floor (all together called existing coat 1 in the following) into a permeable artificial turf. Thus, the aforementioned existing coat 1 is left almost as it is, and on its surface a permeable buffer material 2 is laid to form a new permeable layer 3, followed by laying artificial turf 4 on the surface of the permeable layer 3 (refer to Figure 1).

[0021]

In this embodiment, the existing coat 1, regardless of permeability, can be, for example, permeable asphalt/concrete-laid permeable artificial turf, impermeable hard coat of the asphalt type, acrylic type or vinyl acetate type, impermeable hard coat of urethane or rubber type such as rubber chips, synthetic rubber, etc.



[0022]

Therefore, according to this embodiment, regardless of permeability, existing coat 1 is left almost completely untouched, and merely by laying a permeable buffer material 2 and an artificial turf 4 on its surface a permeable all-weather artificial turf coat with a permeable layer can be constructed easily.

[0023]

The embodiment of the renewal construction method of existing coats described under Claim 2 is explained as follows with reference to Figure 1.

[0024]

This embodiment is suitable for renewing an impermeable existing coat 1. Thus, for example, for an impermeable existing coat 1, which comprises asphalt 12 laid on the surface of a road bed 11 as shown in Figure 1A, the surface is processed to make it flat by simple repair and then is left as it is (refer to Claim 4). On the surface, as shown in Figure 1B, a permeable buffer material 2 is laid to form a new permeable layer 3, followed by laying an artificial turf 4 on the surface of the permeable layer 3 (refer to Figure 2).

[0025]

Therefore, according to this embodiment, an impermeable existing coat 1 can be left almost as it is and be replaced by a permeable artificial turf formed simply by laying a permeable buffer material 2 then an artificial turf 4 on its surface.

[0026]

The embodiment of the renewal construction method of existing coats described in Claims 3-5 is explained as follows based on Figure 3.

[0027]

This embodiment is suitable for renewing a permeable existing coat 1. Thus, for example, it is suitable for a permeable existing coat 1 with artificial turf, which comprises a road bed 11, permeable asphalt 13 laid on the surface, and an artificial turf 5 in which sand 6 is mixed in advance, on the surface of asphalt 13, as shown in Figure 3A. As shown in Figure 3B, the sand 7 is introduced into the artificial turf 5 in the existing coat 1 and processed to make it flat (refer to Claim 5), a permeable sheet 8 of vinyl type or nonwoven fabric is laid on the surface, and the aforementioned permeable buffer material 2 is laid on the surface of the permeable sheet 8, to

form a new permeable layer 3, followed by laying an artificial turf 4 on the surface of the permeable layer 3 (refer to Figure 3C).

[0028]

Therefore, according to this embodiment, when an existing coat 1, which was permeable originally, has become impermeable after public use, the originally permeable existing coat 1 is left as it is, and a permeable buffer material 2 and an artificial turf 4 are laid on its surface. By these simple procedures, the artificial turf can be regenerated with ensured permeability.

[0029]

The embodiment of the renewal construction method of existing coats described under Claim 6 is explained as follows by the way of Figure 4.

[0030]

This embodiment is suitable for renewing an existing building roof to create an outdoor tennis court.

[0031]

Thus, for example, on roof 10 of a reinforced concrete building or a steel-framed-reinforced-concrete-structure 9, the aforementioned permeable buffer material 2 is laid on the surface of roof 10, to form a new permeable layer 3, and then an artificial turf 4 is laid on the surface of the permeable layer 3. In this way, an artificial turf coat with ensured permeability can be simply constructed on the roof of the building. Before laying the permeable buffer material 2, a permeable sheet 8 can also be laid in advance as shown in Figure 3B.

[0032]

The embodiment of the renewal construction method of existing coats described under Claims 7-10 is explained as follows by the way of Figures 5-7. These modes of embodiment are suitable for the permeable buffer material 2 with excellent permeability used in the above various embodiments.

[0033]

In the embodiment of the invention described under Claim 7, the permeable buffer material 2 is made of a synthetic resin buffer material 2A. Thus, as shown in Figure 5, the permeable buffer material 2A is formed by coating the surface of a fine, string-like material 20

made of a vinylidene chloride and vinyl chloride copolymer, with a urethane-type resin liquid, subjecting the fine, string-like material to compression processing, so that it may not be divided into predetermined thickness and has areas with many openings 21, hence providing permeability and resistance to deterioration. Moreover, the permeable buffer material 2A is compression-processed into a predetermined thickness, such as 5 mm. It can be used in any multiple layers. For the compression, the strings of the aforementioned string-like material 20 are processed together so that they cannot separate. At that point, strength is established so that the artificial turf 5 laid on its surface has a certain degree of cushioning and sufficient strength to tolerate various loads and impacts generated by athletes during various sports and has sufficient recovery power.

[0034]

Furthermore, because the above synthetic resin-made permeable buffer material 2A is formed by compressing the fine string-like material 20 into an irregular form, the sizes of the opening sections 21 are heterogeneous. When compressed together, many strings can be tightly pressed together, with the fine string-like material 20 positioned on an opening section 21 underneath, the opening section 21 of a fine string-like material 20 positioned above the above fine string-like material 20, and so on.

[0035]

Because the fine string-like material 20 constituting synthetic resin-made permeable buffer material 2A originally has an excellent traction force, even if the strings of the above fine string-like material 20 are not aligned perfectly, they can still be pressed together. Accordingly, indirectly by various impacts and loads from the above artificial turf 4, the above fine string-like material 20 bends but does not break due to the traction. Consequently, the above permeable buffer material 2A maintains its normal form, thereby securing the permeability and buffer functions over a long period of time. Moreover, if necessary, multiple sheets of the permeable buffer material 2A can be laminated together, or can be compressed into a particular thickness during preparation stage (Figures omitted).

[0036]

In the embodiment of the invention described under Claim 8, the permeable buffer material 2 is a permeable buffer material 2B made of plant fibers. As shown in Figure 6, plant fiber (such as coconut seed, etc.) material 22 is compressed into a particular thickness and allowed to have areas with many openings 23 to provide permeability.

[0037]

It can also be produced from a permeable buffer material 2C made of wire. Thus, as shown in Figure 7, corrosion-resistant wire 24 is compression-processed into a specified thickness to have areas with many openings 25 thereby providing permeability.

[0038]

This method can also be used for introducing sand, small ballast, rubber powder, plastic powder or glass powder, a single material or a combination of multiple materials, in a specified quantity in the open section 21, 23 or 25 of the various permeable buffer materials 2 (2A, 2B and 2C) (Claim 9).

[0039]

Moreover, to transport and handle the permeable buffer material 2 (2A, 2B or 2C), the above various permeable buffer materials 2 (2A, 2B and 2C) are preferably processed as plates (rectangular plates) in sizes that allow for easy transportation as shown in Figures 5 and 6 (Claim 10). The permeable buffer material 2 (2A, 2B or 2C) can also be processed as rolls, which are then cut into appropriate lengths for laying at construction sites.

[0040]

The above synthetic resin-made permeable buffer material 2A, made of plant fiber (from coconut seed, etc.), permeable buffer material 2B and permeable buffer material 2C made of wire can be pasted in advance onto the back surface of the new artificial turf 4 to be laid on the surface of the permeable buffer material. Moreover, sand, small ballast, rubber powder, plastic powder or glass powder, a single material or a combination of multiple materials, can be introduced in advance in a specified quantity in the section with openings 21, 23 or 25 of the various permeable buffer materials 2 (2A, 2B and 2C). When pasted onto the artificial turf 4, a thin sheet can also be pasted on, so that the introduced material does not flow out.

[0041]

[Effect of the Invention]

The renewal construction method of existing coats of Claim 1 allows for formation of a permeable layer by laying a permeable buffer material and an artificial turf on the surface of the existing coat which is left almost untouched. Since the new artificial turf with secured permeability can be easily constructed, construction period and cost can be reduced.

[0042]

With the invention of Claim 2, for existing coats or parking lots that were originally impermeable a new artificial turf with secured permeability and increased application value can be constructed easily by laying a permeable buffer material and an artificial turf on the surface of the existing coat which is left almost completely untouched.

[0043]

With the invention of Claims 3-5, existing coats that were originally permeable but the permeability has been worsened or has been deteriorated after public use, a new artificial turf with secured permeability can be constructed easily with a permeable layer formed, by laying a permeable buffer material and an artificial turf on the surface of the existing coat which is left in place as it is. Thus, existing coats can be used over a long period of time at a low cost. Moreover, there is no need to dispose of the artificial turf, asphalt, etc., that constitute the old existing coat, as industrial wastes, and hence there is no problem with illegal disposal or environmental pollution.

[0044]

With the invention of Claim 6, simply by laying a permeable buffer material and an artificial turf on the roof of a building, a permeable all-weather coat can be easily constructed, which contributes to expansion of new applications.

[0045]

With the invention of Claims 7-10, as the above permeable buffer materials in the above various renewal construction methods, various buffer materials, such as synthetic resin, plant fiber and wire can be used. Not only can permeability be well ensured, but also the construction can be performed at a low cost. Moreover, due to its lightweight and compact nature, the construction is easy and convenient.

[Brief Description of the Figures]

[Figure 1]

A and B are process Figures of the renewal construction method of existing coats.

[Figure 2]

It is a perspective diagram of Figure 1 B.

[Figure 3]

A, B, and C are different process Figures of the renewal construction methods of existing coats.

[Figure 4]

It is a cross section showing the construction point in the building roof.

[Figure 5]

It is a perspective diagram showing the permeable buffer material made of a synthetic resin.

[Figure 6]

It is a perspective diagram showing the permeable buffer material made from a plant fiber.

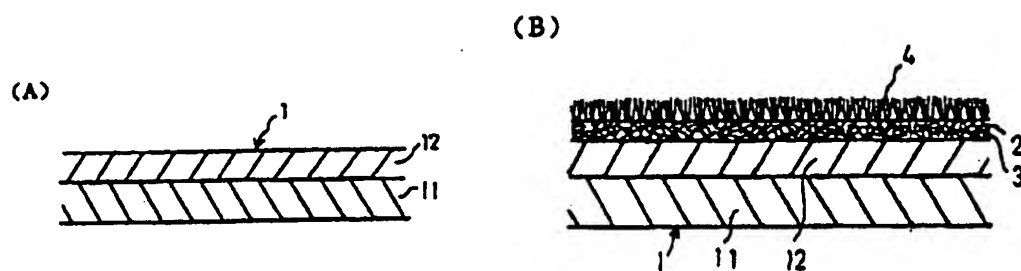
[Figure 7]

It is a side view diagram showing the permeable buffer material made from a wire.

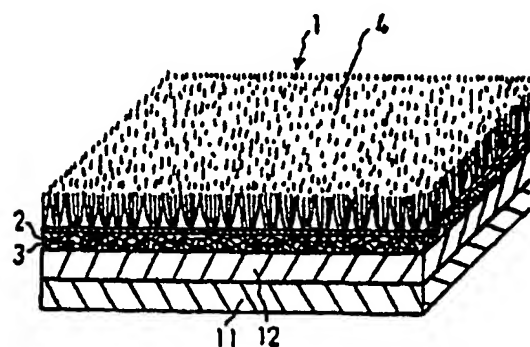
[Description of Notations]

- 1 Existing coat
- 2 Permeable buffer material
- 3 Permeable layer
- 4 Artificial turf
- 5 Artificial turf
- 7 Sand
- 8 Permeable sheet
- 9 Building
- 10 Roof
- 20 String-like material
- 21 Areas with openings
- 22 Material made from plant fiber
- 23 Opening section
- 24 Corrosion-resistant wire
- 25 Area with openings

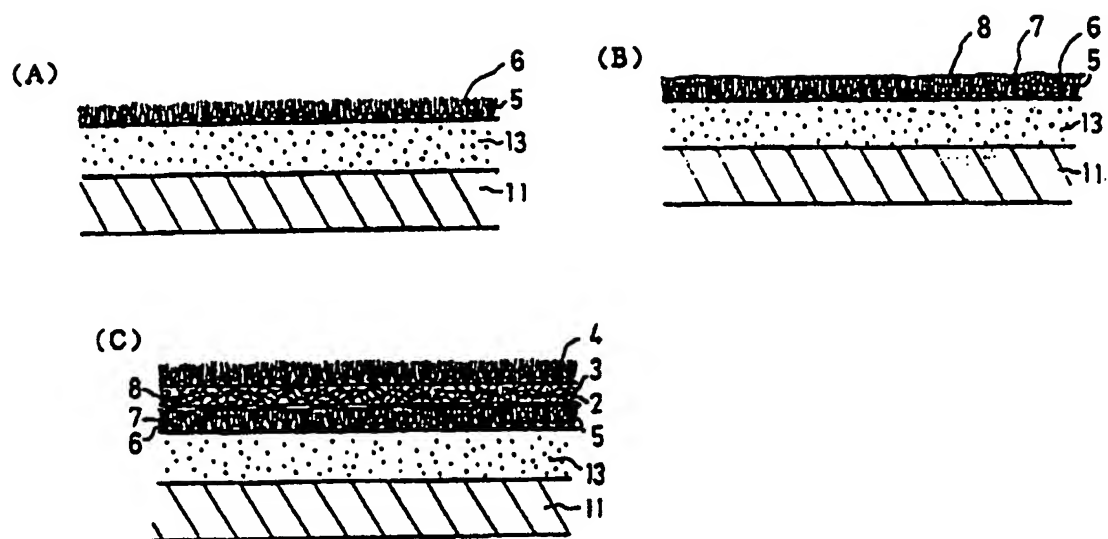
[Figure 1]



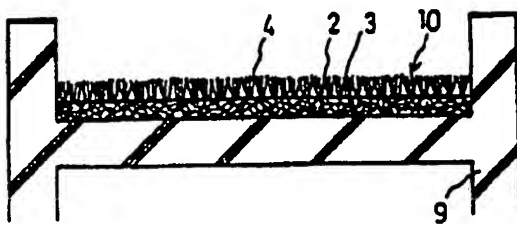
[Figure 2]



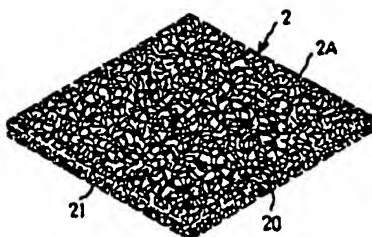
[Figure 3]



[Figure 4]

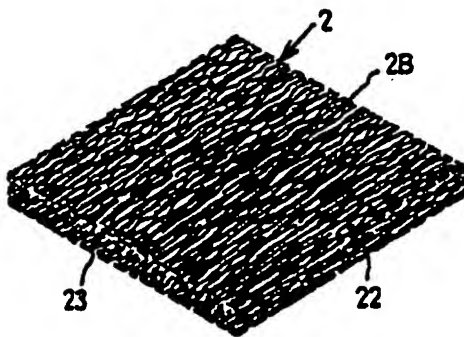


[Figure 5]

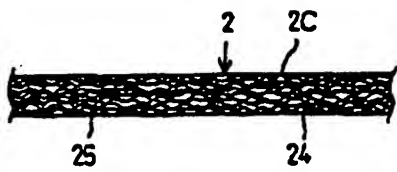




[Figure 6]



[Figure 7]



# PATENT ABSTRACTS OF JAPAN

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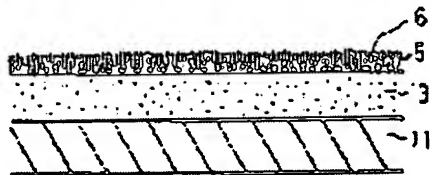
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(71)Applicant : NISSHO SPORTS KOGYO KK

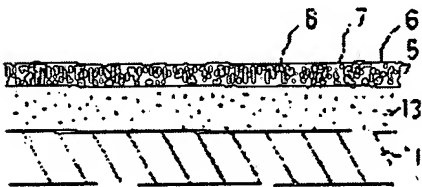
(22)Date of filing : 30.05.2000 (72)Inventor : OKADA KAZUYOSHI

## (54) RENEWAL METHOD OF EXISTING COATS

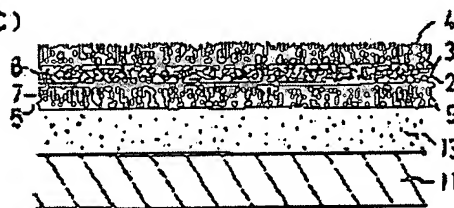
(A)



(B)



(C)



(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a rational and economic renewal construction method reproduced as an artificial lawn coat securing permeability as existing permeable coats in which permeability is worsened by impermeable all-weather existing coats or secular use.

**SOLUTION:** On the existing coat or ground, a permeable buffer material 2 is laid on the upper face to newly form a permeable layer 3 in the state that the existing coats is left as it is, and the artificial lawn 4 is laid on the upper face of the permeable layer 3. In the case of the existing coat 1 previously laying the artificial lawn 5, a permeable sheet 8 is laid on the upper face after sand is supplemented to the artificial lawn 5 of the existing coat 1 to be flatly processed, and the permeable layer 3 is formed on the upper

face by the permeable buffer material 2 to lay the artificial lawn 4.